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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PHAN, HANH	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 08/12/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/724,256	DESALVO ET AL.	
	Examiner	Art Unit	
	Hanh Phan	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21-31* is/are allowed.

6)☒ Claim(s) *1-4,6-14 and 16-20* is/are rejected.

7)☒ Claim(s) *5 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 05/17/2004.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 6, 9-11, 13, 16, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi (US Patent No. 5,675,428) in view of Kogure et al (US Patent No. 5,636,048).

Regarding claim 1, referring to figure 1, Henmi discloses an optically amplified receiver comprising:

an optical preamplifier (i.e., optical pre-amplifier 301, Fig. 1) for receiving an optical communications signal over a fiber optic communications line;

a bandpass filter (i.e., an optical bandpass filter 302, Fig. 1) operatively connected to the optical preamplifier (9) for receiving the optical communications signal;

a PIN detector (i.e., a PIN detector 303, Fig. 1) for receiving the optical communications signal from the bandpass filter (34) and converting the optical communications signal into an electrical communications signal (col. 4, lines 44-50 and col. 8, lines 43-45).

Henmi differs from claim 1 in that he fails to teach an amplifier circuit for amplifying the electrical communications signal. However, Kogure in US 5,636,048 teaches an amplifier circuit for amplifying the electrical communications signal (Fig. 1, col. 1, lines 19-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the amplifier circuit as taught by Kogure in the system of Henmi. One of ordinary skill in the art would have been motivated to do this since Kogure suggests in column 1, lines 19-52 that using such an amplifier circuit has advantage of allowing amplifying the signal to a desired level.

Regarding claim 11, it would have been obvious to obtain a printer card assembly containing the optical preamplifier, PIN detector and amplifier circuit as an integrated receiver assembly in order to reduce size, weight, space, power consumption and cost of the whole system.

Regarding claims 3 and 13, the combination of Henmi and Kogure differs from claims 3 and 13 in that it does not specifically teach the PIN diode is operative at about 3.3 volts. However, it is well known in the art that there is inherent a high power supply voltage or a low power supply voltage providing for a photodiode (PIN photodiode or APD photodiode) to bias. Whether to use a high power supply voltage or a low power supply voltage providing for a PIN photodiode to bias would have been within the knowledge of a person having ordinary skill in the art and would have been an obvious engineering design choice. Moreover, providing a low power supply voltage for a photodiode have advantage of allowing increasing the sensitivity of the photodiode and reduce the power consumption. Therefore, it would have been obvious to obtain the PIN

diode is operative at about 3.3 volts in order to provide a photodetector having a high speed of response to light and lower power.

Regarding claims 6 and 16, Henmi further teaches the optical preamplifier (Fig. 1) is connected to a single wavelength optical communications line.

Regarding claims 9 and 19, the combination of Henmi and Kogure teach an electronic limiting amplifier (Fig. 1 of Kogure).

Regarding claims 10 and 20, the combination of Henmi and Kogure teaches the amplifier circuit comprises a decision circuit and clock recovery circuit for retiming the electrical communication signal (Fig. 1 of Kogure).

4. Claims 2, 7, 8, 12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi (US Patent No. 5,675,428) in view of Kogure et al (US Patent No. 5,636,048) and further in view of Vanoli et al (US Patent No. 5,712,716)

Regarding claims 7 and 17, the combination of Henmi and Kogure differs from claims 7 and 17 in that it fails to teach the optical communications signal that is received over the optical communications line comprises a wavelength division multiplexed optical communications signal. However, Vanoli in US 5,712,716 teaches the optical communications signal that is received over the optical communications line comprises a wavelength division multiplexed optical communications signal (Fig. 1, col. 7, lines 17-67 and col. 8, lines 1-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the optical communications signal that is received over the optical communications line comprises a wavelength

division multiplexed optical communications signal as taught by Vanoli in the system of the combination of Henmi and Kogure. One of ordinary skill in the art would have been motivated to do this since Vanoli suggests in column 7, lines 17-67 and col. 8, lines 1-10 that using such optical communications signal that is received over the optical communications line comprises a wavelength division multiplexed optical communications signal have advantage of allowing providing an optical communication system with high bandwidth and high speed.

Regarding claims 8 and 18, the combination of Henmi, Kogure and Vanoli teaches further comprising a demultiplexer (Fig. 1 of Vanoli) operatively connected to the preamplifier and band pass filter for demultiplexing the wavelength division multiplexed optical communications signal.

Regarding claims 2 and 12, the combination of Henmi, Kogure and Vanoli teach the bandpass filter is a tunable bandpass filter (col. 7 of Vanoli, lines 45-67, col. 8, lines 1-40 and col. 11, lines 20-48).

5. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi (US Patent No. 5,675,428) in view of Kogure et al (US Patent No. 5,636,048) and further in view of Hatakeyama (US Patent No. 5,517,351).

Regarding claims 4 and 14, the combination of Henmi and Kogure differs from claims 4 and 14 in that it fails to teach a laser for pumping the optical and a laser driver interfaced with the laser used for pumping the optical preamplifier. However, Hatakeyama teaches a laser (i.e., a pumping semiconductor laser 7, Fig. 1) for pumping

the optical preamplifier (i.e., an erbium-doped optical fiber 2, Fig. 1) and a laser driver (i.e., a driving circuit for pumping semiconductor laser 16, Fig. 1) interfaced with the laser used for pumping the optical preamplifier (col. 3, lines 24-67 and col. 4, lines 1-3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the laser for pumping the optical and a laser driver interfaced with the laser used for pumping the optical preamplifier as taught by Hatakeyama in the system of the combination of Henmi and Kogure. One of ordinary skill in the art would have been motivated to do this since Hatakeyama suggests in column 3, lines 24-67 and col. 4, lines 1-3 that using such a laser for pumping the optical and a laser driver interfaced with the laser used for pumping the optical preamplifier have advantage of allowing increasing the power level of signal to maintain the output level and reducing the loss of the signal.

Allowable Subject Matter

6. Claims 5 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 21-31 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

-With respect to claims 5, 15 and 21-26, the prior art fails to teach and render obvious an optically amplified receiver comprising: a low noise, gain flattened, erbium doped optical preamplifier for receiving an optical communications signal over an optical communications line; a bandpass filter operatively connected to said optical preamplifier for receiving the optical communications signal, selecting a single channel, and filtering out noise produced by the optical preamplifier; a laser driver operatively connected to said optical preamplifier and bandpass filter for driving said preamplifier and comprising, an injection laser diode; a current source control loop circuit connected to said injection laser diode that establishes a fixed current through the injection laser diode; and a voltage switcher circuit connected to said injection diode and current source control loop circuit, said voltage switcher circuit adapted to receive a fixed supply voltage and convert inductively the supply voltage down to a forward voltage to bias the laser diode and produce an optical output into the preamplifier having minimized power losses; and an optical-to-electrical conversion circuit operatively connected to said preamplifier for converting the optical communications signal into an electrical communication signal.

-With respect to claims 27-31, the prior art fails to teach and render obvious an optically amplified receiver comprising: a low noise, gain flattened erbium doped optical preamplifier for receiving a wave division multiplexed optical signal over a single optical communications line; a bandpass filter operatively connected to said optical preamplifier for receiving the optical signal, selecting a channel, and filtering out noise produced by the optical preamplifier; a laser driver operatively connected to said optical preamplifier and bandpass filter and comprising, an injection laser diode; a current source control

loop circuit connected to said injection laser diode that establishes a fixed current through the injection laser diode; and a voltage switcher circuit connected to said injection diode and current source control loop circuit, said voltage switcher circuit adapted to receive a fixed supply voltage and convert inductively the supply voltage down to a forward voltage to bias the laser diode and produce an optical output into the preamplifier having minimized power losses; a demultiplexer circuit operatively connected to said low noise, gain flattened erbium doped optical preamplifier for demulitiplexing the wave division multiplexed optical signal into demultiplexed optical signals; a plurality of receiver channels for receiving the demultiplexed optical signals; and an optical-to-electrical conversion circuit positioned within each receiver channel for converting the optical signals into electrical communication signals.

Response to Arguments

9. Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kaminow (US Patent No. 5,077,728) discloses frequency division multiple access network.

Veith (US Patent No. 5,317,660) discloses optical transmission system.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (703)306-5840.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

Hanh Phan
Patent Examiner
Art Unit 2633
Hanh Phan
08/06/04